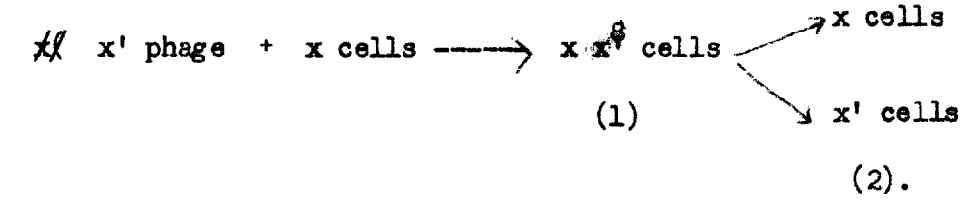
May 26, 1954

Dear Professor Uetake:

Thank you for your message of May 18, I was very happy to have your explanation of your comment on genetic replacement, which is, of course, entirely valid. I would like to mention however that whereas, in Salmonella, we do not detect transductive changes other than final replacement, we have been studying recently a somewhat similar transduction system in E. coli. In this system, an intermediate form is found, an apparent "heterozygote", which carries both the old and the new factors. From this, one can then obtain types in which replacement is completed. Symbolically, if x represents the factor in the recipient strain, and x' the donor, we then have the following sequence:



In Salmonella, apparently, stage(1) is so brief that it cannot be directly detected, so that we have evidence only of the final stage (2); In E. coli, both stages are detected so that the sequence can be verified.

In reading your account, I had focussed my attention on the result: 3,10 → 3, 15, which you will realize is a replacement, but now agree as to the importance of the 3,10,15 types, which would correspond to the intermediate stage(1). Have you studies these 3,10,15 types to determine whether you can then obtain from them 3,10 and 3,15 derivatives? [I would expect that you would. Note that I am using arabic designations as adopted by the International Salmonella Subcommittee, though I do not prefer them myself].

Is there any possibility at all that the 3,10,15 types represent mixtures of 3,10 and 3,15?

At any rate, this point is not a decisive difference from transduction. The most important consideration is whether <u>every</u> lysogenized 3,10 bacterium becomes 3,15 (or 3,10,15) i.e., whether every phage particle carries the potentiality of this genetic change. If it does, one cannot speak of the phage as merely a passive carrier.

I am looking forward to seeing your ms., but hope some evidence on this crucial issue will be included with it. In view of the barriers of language and distance, it may be necessary for you to name someone here with authority to read proof and make verbal corrections on your behalf. If you are acquainted with some colleague in the U.S., I suggest you request this favor; if not, I will be happy to do it. I recommend, however, that you send at least one extra carbon copy to help review and communication with you.

Yours sincerely,

Joshua Lederberg